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DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

Yellowstone NATIONAL PARK

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MONTHLY REPORT

for

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1921.

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MONTHLY REPORT

1921.

JANUARY

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Notes of Park Naturalist, and Ch.Ran.Monthly Report, filed herewith.

Lindsley

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
YELLOWSTONE NATIONAL PARK
YELLOWSTONE PARK, WYO.

OFFICE OF THE SUPERINTENDENT

February 9, 1921.

Dear Sir:

The following is report on conditions in Yellowstone National Park, and on the operation of the park, for the month of January, 1921.

GENERAL CONDITIONS:

The monthly mean temperature at Headquarters (Mammoth) was 20.6, a departure from normal of plus 3.0. No unusual temperature extremes occurred, there being but one cold period during the month, viz., from the 6th to the 12th inclusive. The lowest was -15° on the 11th.

Precipitation records showed a total of 1.49 inches. Departure -0.75 inch. With the exception of the 10th and 11th, unsettled weather with snow prevailed during the first 20 days. The first half of the last decade was generally fair, but unsettled conditions returned on the 27th and continued to the close of the month. There were 18 days with a measurable amount of precipitation.

The total snowfall was 14.6 inches. Normal 20.6 inches. Although the monthly snowfall was below normal, the number of days on which snow fell was considerably above the average. The greatest depth on the ground was 15.7 inches from the 9th to the 12th inclusive. Much drifting occurred from the frequent high winds.

An unpleasant feature of the month's weather was the frequency of high winds during the first three weeks. The maximum velocity of 42 miles from the southwest on the 5th has not been exceeded in January; however, it was equaled in 1917.

Sunshine: Percentage of possible, 35. Normal, 38.

The statistics given above refer to the Mammoth Hot Springs (Park Headquarters), and are as furnished by the Observer, U.S. Weather Bureau, Mr. H.H. Fletcher, whose

Monthly Meteorological Report for January is enclosed. In addition to the data secured by Mr. Fletcher from his own observations, daily temperature and precipitation records are taken by rangers at Soda Butte, Lake, Riverside, Snake River, and Gallatin Stations, and reports are furnished him monthly from these stations. An interesting report of snow on the ground at various stations at the end of January, 1920, and 1921, follows:

Station	DEPTH OF SNOW JAN. 31.	
	1921	1920
Mammoth Hot Springs,	10½ inch	8.6
Norris,	36	20.0
Riverside,	36	30
Gallatin,	24	27.3
Bechler,	40	--
Snake River,	52	49
Thumb,	40	--
Lake,	41	34.5
Upper Yellowstone,	41	37.0
Sylvan Pass (East Entrance),	34	37
Canyon,	50	50
Tower Falls,	24	20.0
Buffalo Ranch,	22	14.5
Soda Butte,	30	

These depths do not vary much from those of December 31, 1920, but the water content is much greater, due to the fact that there were several thawing days, which settled the snow.

The general weather conditions, which were considerably milder than usual for January so far as temperature and precipitation were concerned, were most favorable to our wild animals and they are all still in excellent condition. The winter is now so far advanced that chances of extensive loss from starvation and cold seem very remote, though a slight falling off in flesh is apparent among the elk and deer. While the snow on the lower ranges where the animals are finding their winter feed did melt and crust to some extent during January, just before the thaw came there were several days of severe wind which swept bare many acres of the range, and the grass is still plentiful and fairly easy to get at, and the animals have not been obliged to seek their forage from the lower levels outside of the park to any great extent. The crusted condition of the snow did, however, make the work of patrolling on horseback much more difficult and hard on the horses so used. The

usual big drifts are in evidence on the roads in the park at about the usual locations. The drift in the road in Golden Gate opposite Rustic Falls is so large and the snow so hard that it became a difficult feat for rangers and winter keepers going back and forth on skis to climb over it. A heavy rope has been knotted and fastened securely at the top of the bluff above the road to afford safety in scaling this drift.

The only road open to travel during January was the Mammoth-Gardiner road, 5 miles. The contractor who carries mail through the park between Gardiner, Montana, and Cooke, Montana, used light horses and light sleigh, traveling on top of the snow on the road via Tower Falls and Soda Butte, but this is hardly equivalent to keeping the road open, as only very light loads could be taken, and only small horses accustomed to this sort of work could make any progress. The round trip is made once a week in winter, usually leaving Gardiner on Sundays and leaving Cooke on the return trip on Thursdays. With good luck the trip takes two days each way. Two relays of horses are provided -- one at Tower Falls and one at Soda Butte.

The Mammoth-Gardiner road was open for motor travel throughout the month, but following January 5th, when it was warm enough to thaw, the road became quite icy and slippery, rendering it difficult to haul full loads with heavy trucks. In addition to this, the first mile north of Headquarters was drifted full of new snow, which also made it hard traveling for trucks. These conditions made it difficult to haul several car loads of coal which arrived during the month. The 75 horsepower Caterpillar Tractor was put in use with six Troy Trailers to overcome this difficulty, but the icy condition of the road was also a handicap for it, and the hauling was done with more than ordinary trouble and expense. Some of the coal was dumped in piles one to two miles from Mammoth so as to get the cars unloaded before demurrage charges might be too great. This is to be hauled later with teams or trucks when road conditions will permit.

The winter has been so mild that it was not until January 20th that ice was thick enough to harvest. It was then but 15 inch in thickness on the old reservoir at Mammoth, and is only 18 inches thick at present.

Travel.

Enclosed is Chief Ranger's Travel Report for January, 1921, and for January, 1920, for comparison. Aside from the regular tourist season and one or two months preceding and following it, these comparisons are of little significance, as the little travel reported in winter is all from one entrance (the northern) and represents only the trips of a few people coming to Gardiner or Mammoth on business. An occasional exception to this is a visitor who hears of the opportunity to see live wild animals in their native habitats, and is willing to endure the hardships of a night in a third rate hotel in Gardiner for the pleasure of seeing the animals and getting photographs of them. Such are also usually privileged to visit park headquarters and view Mammoth Hot Springs, the main part of which is easily accessible and even more beautiful and wonderful in winter than in summer.

Labor and Supply Market.

No labor was required in the park and vicinity, as there was nothing going on outside of ordinary winter activities, care of property, etc.

The main supplies received during January consisted of several carloads of coal from local Montana mines purchased for fuel at market prices, which have not changed materially from war time conditions.

II. PERSONNEL.

Employees.

On January 1st there were 65 employees on duty under this office, but by January 31st there were but 64 so employed.

The following list shows number of employees of various classes serving under appointment during the month, with general statement of the kind of work performed:

No.	Class	Kind of work performed.
2	Asst. Engineers	Office engineering and filing and cataloguing records.
4	Clerks	1 disbursing agent and purchasing clerk; 1 clerk on cost account work and property; 1 stenographer-typist on orders, proposals, and vouchers; 1 stenographer-typist on stenographic work, files, and cutting and pasting clippings.

No.	Class.	Kind of work performed.
2	Electricians	Read meters; did necessary line work, and operated power plant regular shifts, including Sundays.
1	Foreman	In charge of stables at headquarters, and putting up ice.
1	Telegraph Operator	Sent and received all Government Western Union messages; operated one shift on telephone switchboard.
1	Telephone Switchboard Operator	Operated telephone switchboard, daily shifts, including Sundays.
1	Master Mechanic	In charge of shops, and of repairs to heavy road machinery.
1	Blacksmith	General blacksmith work, including shoeing horses in shop; overhauling and repairing tools and equipment.
1	Steward and Master of Transportation	In charge of all transportation and of storehouses. (On leave since noon, December 30th).
1	Painter	Renovated quarters at headquarters, also painted signs and equipment.
1	Lineman	In charge of telephone and telegraph system. Did emergency work and installed instruments, also moved storeroom.
7	Laborers	Teaming, freighting, work in warehouse, putting up ice, and miscellaneous work at headquarters.
1	Handyman	Worked in storehouse issuing and receiving supplies, also assisting in putting up ice, and hauling [illegible]
1	Buffalo Keeper	In charge of tame buffalo herd.
1	Asst. Buffalo Keeper	Assisting buffalo keeper.
1	Park Naturalist	Scientific research work.
1	Plumber	In charge of general plumbing and repairs to same at headquarters.

No.	Class	Kind of work performed.
1	Motorcycle Mechanic	Repairing motorcycles. (Resigned effective Jan. 24, 1921).
2	Automobile Mechanics	Repairing motor trucks and touring cars.
1	Watchman	Made hourly patrols during night at Headquarters; took care of office, and kept furnace going during the night.
1	Carpenter	Repaired buildings at Headquarters and overhauled equipment in shop.
1	Chief Ranger	In charge of Ranger force.
2	Asst. Chief Rangers	1 in charge of northern district; 1 in charge of western district (Transferred to Grand Canyon, effective January 15, 1921).
6	First-class Pk Rangers	In charge of ranger stations and making patrols.
16	Park Rangers	In charge of ranger stations, doing patrol work, etc. 1 in charge of southern district as Acting Assistant Chief.
3	Temporary Park Rangers	Doing regular patrol work. 1 assisting in Chief Ranger's Office.
1	Fireman	In charge of furnaces at headquarters.

In addition to the regular employees listed above under appointment, the following were employed temporarily by the day:

	On Jan. 1st	On Jan. 31st
Laborers	1	3
Skilled Laborers	1	0
	2	3

Leaves of Absence.

During January annual leaves of absence were granted as follows:

J.H. Dupuis,	Park Ranger,	1½ days - Jan. 3-4 (noon)
E.S. Bowman,	" "	6 " - Jan. 3-8
John Delmar,	Steward & Master of Transportation,	On leave since Dec. 30-noon

Carrie Haumesser,	Stenog.-Typist,	1 day	- Jan. 3
Clarence Scoyen,	Laborer,	1½ "	- Jan. 3-4 (noon)
A.C. Neumann,	Painter,	1 "	- Jan. 3-noon-4-noon
E.T. Scoyen,	Park Ranger,	1½ "	- Jan. 3-4 (noon)
Sam T. Woodring,	Park Ranger,	3 "	- Jan. 3-5
Helen R. McNutt,	Stenog.-Typist,	1 "	- Jan. 8
Jack H. Harvey,	Motorcycle Mechanic,	13 "	- Jan. 10-24
George Wimm,	Park Ranger,	11½ "	- Jan. 10(noon)-22
George T. Dustman,	Clerk,	1 "	- Jan. 11
Helen R. McNutt,	Stenog.-Typist,	7 "	- Jan. 22-29
Nellie Roach,	Telephone Operator,	6 "	- Jan. 3-8--Sick Leave.
Peter Lawson,	Park Ranger,	21 "	- Dec.23-Jan.12-Sick Lv.
Court B. Dewing,	" "	24 "	- Jan. 3-26--Sick Leave.
Albert L. McLaughlin,	" "	6 "	- Jan. 17-22
George T. Dustman,	Clerk,	2 "	- Jan. 18(noon)-20(noon)
Charles J. Smith,	Asst.Chief Pk.Ranger,	7 "	- Jan. 7-14
T.C. Pound,	Park Ranger,	1 "	- Jan. 24(noon)-25(noon)
F.J. Townsend,	" "	6½ "	- Jan. 24(noon)-31
C.B. Dewing,	" "	4 "	- Jan. 27-31
August C. Neumann,	Painter,	* 6 "	- Jan. 17-22--Sick Leave
*Sick Leave applied for.			
B.C. Lacombe,	Buffalo Keeper	1½ "	- Jan. 29(noon)-31
George T. Dustman,	Clerk,	1 "	- Jan. 29(noon)-31(noon)
Calvin C. Davis,	Park Ranger,		

Appointments.

There were no appointments becoming effective during the month.

III. WORK COMPLETED:

(a) Construction of Physical Improvements.

There was no construction work in progress during the month of ~~December~~ January.

(b) Maintenance and Repair of Physical Improvements.

(c) Miscellaneous Improvement Work.

A complete paper location of the Firehole Cutoff has been made, leaving only the final location to be made on the ground next spring.

A sketch of the old engineer storehouse was made, altering the interior to make a bunk house for 34 men in one end, and 9 rooms for permanent men, such as truck drivers, in the other end.

A new map of Headquarters was made, scale 200' equals 1", for the purpose of showing all wire details, telephone, electric lines, etc. It was first intended that these details could be placed on the large map of scale of 100' to the inch, but this would place too much detail on one map. The smaller map has the contour lines omitted and

is much more satisfactory for field work, and again the small map will in many cases answer the same purpose as the large one and still do away with the large expensive prints. Some progress has been made in bringing the large map up to date, but all sewer and water mains have not been checked up and placed on this map.

A file of all engineering information from technical magazines was completed. It is filed in such a way that any information on any subject can be readily obtained.

The design and estimate for the Canyon Camp water supply was made, and a map of the topographical features of the Canyon Camp. The prints and reports were forwarded to the Yellowstone Park Camps Company.

A check survey was made on the slide in the Gardiner Canyon. A special report on this work, by Assistant Engineer L.L. Hill, illustrated by blue print, is appended to this report. This report is of special interest in that it is likely later to develop into expensive and serious slides similar to the one which occurred on the same road just south of there and which necessitated placing the road on the opposite side of the river.

(d) Service to the Public.

Due to the fact that there was practically no travel to the park, there is nothing to report under this heading.

Information Service:

88 Yellowstone National Park publications were sent out free. 69 short letters were sent out in reply to simple inquiries; 10 more letters requiring longer, more technical replies were answered after spending the necessary time in searching out the information. In addition to the above, 125 letters applying for positions were answered, mostly by referring the applicants to the Hotel Company, the Camps Company, or the Transportation Company, depending upon the tone of the application.

IV. WORK IN PROGRESS:

(a) Construction of Physical Improvements.

No construction was in progress during the month.

(b) Maintenance and Repair of Physical Improvements.

No crews were maintained in the field during the month. The regular shop force made excellent progress in their work of overhauling motor vehicles and gravel loaders, road graders, and other heavy equipment. One of the 5½ ton Mack trucks was taken down and new parts ordered. The carpenter built a new body for the Reo touring car, making it into a service rig for use of the plumber or painter in connection with work in the park. He also did odd jobs of repairs to buildings and made some progress in the remodeling of the center of the "Bachelor Quarters" for the Information Office.

The blacksmith and his assistants shod such horses as were in use by rangers and at headquarters corral; put the finishing touches on the snow plow, which was attached to the 75 horse power Holt Caterpillar Tractor and given a trial among the drifts on the plain at headquarters, so that it could be adjusted ready for opening the roads in the park in the spring if needed. The snowplow has been very materially improved, after the experience of using it in the drifts in the park last winter, by heavy bracing, providing it with heavy casters to hold it at the proper distance from the ground and making adjustments of the point so it can be regulated to run without digging into the road and still go in deep enough to get under the snow. As now adjusted, it will unquestionably do much more efficient work in the snow than it did a year ago. They also made considerable progress in overhauling equipment and small tools, such as picks, shovels, etc. It was also necessary on several occasions to call upon the shop force to furnish men to run the Caterpillar to assist in hauling coal from Gardiner.

The plumber cleaned up his shop preparatory to taking inventory; made minor repairs to plumbing and heating plants in buildings at headquarters, and had general supervision of the water and sewer systems.

The painter was on leave for quite a number of days during the month due to sickness in his family. When on duty he painted several of the metal barrels used for gasoline; began the work of painting the Reo 2-ton truck which had been overhauled in the shop and remodeled into a gasoline truck. He also prepared several boards and wet samples showing the Brewster

Green which has been adopted as the standard color for painting of equipment by the National Park Service; these to be sent later to superintendents of the other parks for their information. A copy of the specifications of this paint is enclosed with this report.

The electricians and linemen working together made necessary repairs to the power and telephone lines, installed instruments where necessary, replaced broken lights, read meters, etc. They also operated the Hydro Electric Power Plant twenty hours daily (12 hours on Sundays and holidays). The power plant generated a total of 12,750 kilowatt hours of electric current during the month. Of this, 900 kilowatt hours were sold to park utilities at the authorized rate of 5¢ per kilowatt hour; 1,239 kilowatt hours were consumed for street lighting, and the balance of 10,611 kilowatt hours were consumed in lighting government buildings, supplying power to our shops, and wasted on the power lines. The peak load for January was 36 kilowatts.

The ranger force continued the special protection afforded to the elk and deer along the north line. They also fed hay throughout the month to about 3,000 elk which they managed to hold on Slough Creek. This required the services of two teams and two men continuously, feeding between 8,000 and 10,000 lbs. of hay per day. Regular winter patrols were also maintained throughout the park and one man was furnished from the ranger force to assist in putting up ice at headquarters, beginning January 17th.

Five carloads of coal were received during the month and this was unloaded by the regular force. This required the services of our transportation, storehouse men, stable foreman, and laborers, practically all the time from the 1st to the 16th of the month. Due to the snow and ice, the road conditions were difficult for hauling, requiring considerable more time than usual for this work.

The office was kept open from 8:30 A.M. to 5:30 P.M. daily except Sundays and holidays. In addition to usual routine work, the work consisted of transferring and straightening up files and scrap books, and the property return was posted up to date preparatory to taking a physical inventory.

With the exception of two or three laborers employed in connection with putting up ice, all employees

were serving under appointment. Requests for annual and sick leave were granted in many cases as their services can be spared better in winter than in summer, and the work in all lines is more or less hindered by the taking of leaves.

Improvements by Park Utilities.

The only employees kept in the park by the Hotel Company during the month were the winter keepers at the Mammoth, Upper Basin, Lake, and Canyon Hotels. The Yellowstone Park Transportation Company had five men employed during the month — one in charge, who also ran the mail stage between Mammoth and Gardiner, and four painters who were engaged in refinishing the Company's automobile stages. The Yellowstone Park Camps Company had three men in its employ during the month, all stationed at Mammoth, namely, an automobile mechanic and assistant engaged in overhauling motor transportation, and one carpenter repairing equipment, making benches, etc.

V. WORK BEGUN:

Beginning on January 17th, the heavy task of putting up ice for the National Park Service and concessioners at park headquarters was begun. All available men and teams were used and assistance was given by the concessioners interested, the work being done jointly and the cost apportioned upon its completion. Excellent progress was made. At the end of January our ice houses had been filled and the work of filling the Hotel Company's house was well under way. 155 tons of excellent ice were put up for our own use, which with the ice left over from last year gives us about 190 tons for next season's use. This work will be completed during the month of February, when a complete report will be made. This work is being done later in the season than usual due to the fact that the winter has been so mild that the ice did not get thick enough to harvest sooner. When the work was begun on January 17th, the ice was 15 inches thick on the pond. At the present writing it is about 18 inches thick.

VI. PLANS OR PROPOSED WORK:

So far as is known at the present time, the public utilities operating in the park have no plans for any new work during the month of February.

The work under this office will consist of practically a continuation of the work already in progress, and it is the intention to give special attention to the work of completing an

inventory of property as soon as the work of putting up ice is completed so that there will be men available for this work.

VII. POLICIES.

No new policies were adopted during the month.

VIII. COST OF OPERATION:

Cost reports showing expenditures for January will be finished and transmitted at an early date.

IX. OTHER MATTERS OF INTEREST:

Wild Animals.

The general conditions of weather, which were most favorable to wild animals of the park throughout the fall and early winter, continued during January. An occasional day of thawing weather followed by cold has crusted the snow in many places on the elk and deer range along the northern boundary, and this condition has interfered to some extent with their feeding. There is a noticeable difference in the condition of these animals, but this is not unusual -- in fact, they are in much better condition now than can usually be expected at this time of the year, and there has been no loss at all from lack of feed. The crusted condition of the snow did, however, seriously interfere with the work of mounted patrols by park rangers along the north line in protecting the animals and trying to keep them back inside of the park and in the Slough Creek Section where hay could be fed. Horses traveling in snow which is crusted, but not hard enough to hold them up soon become discouraged and often the strongest horses will lose heart and practically give up and are of but little use in deep snow thereafter. While this special work was not abandoned because the open season had expired, it was impracticable to continue it on quite so extensive a scale as during the previous months. The force of rangers who were engaged on this special work was somewhat reduced from time to time by accident, sickness, and annual leaves of absence. However, Chief Ranger McBride, Assistant Chief Ranger Trischman, and Rangers Pound, McLaughlin, Dupuis, Townsend, Henry Anderson, and Clifford Anderson, did much hard work during the month on Mt. Everts, Crevice, Blacktail, and Hellroaring, and succeeded in holding back most of the elk that were anxious to cross the line into Montana. Deep snow shut in the Crevice Mountain District and it was abandoned as being of no further use on January 13th.

Zoo

Buffalo, tame herd: The tame buffalo are in excellent condition. Two additional calves were born during the month of January, making a total of five this winter. It has been necessary to feed most of the animals and it has taken about 1,000 lbs. of hay per day to hold them on the Upper Lamar and keep them from the Slough Creek country where the elk are being held. Most of the herd of old bulls are still in the mountains on Soda Butte Creek and Pebble Creek and have not come in to be fed. It is anticipated that considerable of the hay cut last summer can be saved for another year.

Buffalo, wild herd: Twenty-two of the wild herd of buffalo were seen on Pelican Creek by Rangers Bicknell and Russell from Lake Station. The Chief Ranger has given instructions to his men at Soda Butte and Upper Yellowstone to make special trips into the country where the wild herd winters to look up their condition.

Bears: The bears are all in winter quarters and were not seen during January.

Antelope: Special attention was given to our small band of antelope by the ranger force during January. This band is divided into two herds. Both, however, are wintering near Gardiner and are seen every day by the rangers in that station. They seem to be getting plenty of forage and are contented. Only one antelope has been lost during the winter as far as is known up to this date.

Deer: The deer are also in good condition, but are still scattered. Reports indicate that from 12 to 15 mule deer were killed, probably by wolves, coyotes, or lions, during the month. The bucks are beginning to shed their horns. 9 white-tailed deer are wintering close to headquarters and are seen every day.

Elk: With a few exceptions, the elk are in good condition. Many of them remained on the high ridges. About 200 or 300 frequent the grounds near headquarters where they were fed last winter, but their condition does not indicate that they are badly in need of hay. About 65 are reported near the Gallatin Station in the northwest corner of the park and about 200 in the vicinity of the Upper Basin and Fountain. Rangers have continued the feeding of elk on Slough Creek from the hay that was cut for that purpose last year and report that about 3,000 elk are taking the hay there. They also continued the practice of holding the herds of elk back from the park line on Hellroaring and in the vicinity of Gardiner. While the open season

5-yr old bull shot to almost Dec 22/1920 Feb 8 Am

in Montana has expired, it is known from past experience that if any number of elk go outside of the park some of them are liable to be killed for their teeth and by families who are in the habit of securing their meat in the fall and who were disappointed during the past hunting season on account of the open winter. The Forest Supervisor, however, has several men stationed in the Absaroka National Forest just outside of the park charged with the special duty of looking after the interests of the elk and other wild animals that are found outside. Chief Ranger McBride estimates that not over 25 have gone out and remained, and we have had no reports that any killing has been done. The situation is most encouraging and we do not anticipate any great loss among the herds of elk unless unforeseen conditions arise.

Mountain Sheep: 200 to 300 mountain sheep have been reported during the month between Tower Falls and the north line of the park, and we have heard rumors that a few have been seen outside of the park. They are in excellent condition.

Moose: Moose have been seen in small numbers and reported from several ranger stations during the month. The reports indicate that the bulls are shedding their horns, and that all seen were in excellent condition.

Carnivora: Coyotes and wolves have been quite in evidence wherever the elk and deer were found, and the carcasses of several deer have been found, probably killed by these animals. Park Ranger Henry Anderson succeeded in killing 33 during the month, and other employees of the National Park Service killed 7 in the vicinity of Mammoth Hot Springs. Preparations are being made to hunt them on an extensive scale as soon as rangers can be spared for this work.

Trapping: Reports from rangers located near the park borders indicate that the number of trappers working near the borders of the park has diminished appreciably during the month. This is probably due to the fact that furs were very low in price, though the market has recently picked up and furs are again bringing a fair price.

Grazing: There is still a fairly good supply of grass on the ranges along the north line, which are frequented by the elk and deer, but crusts on the snow hinders the animals from securing it in some places.

Additional data on the condition of the wild animals are given under the heading "Seasonal Changes".

Birds.

This subject is treated in the notes furnished by Park Naturalist Skinner under the heading "Seasonal Changes".

Fishes.

No fishing of any consequence was done in the park during the month.

Seasonal Changes.

The following notes on Seasonal Changes in the park were furnished by Park Naturalist M.P. Skinner:

Botanical: No growth and no changes.

Birds: Barrow golden-eyes appeared along the Gardiner River on the 8th and gradually increased until there are now about thirty of these ducks there. Magpies decreased steadily in numbers about the dump at Mammoth. A flock of redpolls appeared at Mammoth on the 1st and remained at least ten days. The following stayed along the Gardiner River: 50 mallard, 6 American golden-eye, the thirty Barrow golden-eye noted above, a Wilson snipe, a kingfisher, 3 song sparrows, 75 dippers, and 8 Townsend solitaires. Near Mammoth were: 15 magpies, 4 nutcrackers, 2 black-headed jays, 3 pair of green-winged teal, and 3 pair of mallard; large mixed flocks of gray-crowned Hepburn, and black leucostictes remained in the neighborhood.

Animals: While one old buck mule deer in poor health cast his horns on the 15th, the remainder of the mule deer have not yet begun to "cast their horns".

The white-tail deer began to shed their horns on the 20th.

The first of the month about thirty elk were feeding on the plaza at Mammoth, but have since left, due possibly to a hard snow crust that formed on the 19th. There have been about seven hundred elk within four miles of Mammoth and some are getting a little thin. Their forage is decreasing perceptibly. About thirty elk are wintering on the top and the southern slope of Terrace Mountain and a similar band on the southern slope of Bunsen Peak. Every animal of both bands is in good condition.

The mountain sheep along the Gardiner Canyon come and go, twelve being seen on the 21st.

The storms of early January made the antelope very uneasy and they made some attempts to leave the park, but frequent high winds and the thaw of the 17th and 18th uncovered some of their range and they became more content. They are now ranging rather high, but the elk are working down and preempting their range somewhat. 30% of the antelope bucks have new horns fully grown, and the remaining 70% have horns six inches or more in length.

The beaver are still cutting small cottonwoods along the Gardiner River.

January has probably the fewest seasonal changes of any month of the year. Consequently, this data is not decisive in character. What there is of it, simply indicates a warm and open season.

Arrests and Violations of Law.

No arrests were made nor were any violations of law within the park reported during the month. The United States Commissioner, John W. Meldrum, left the park on January 14th for an indefinite leave of absence. During his absence he keeps us informed of his address and is always ready to return to the park should his services be needed.

Protection of Wild Animals.

The work of furnishing adequate protection for our elk, deer, antelope, mountain sheep, moose, and other wild animals which inhabit the park, from starvation and the ravages of poachers and their natural enemies, is the most important duty entrusted to our force during eight to nine months of the year. So important is it that practically all of the duties of the entire permanent ranger force, except during the tourist season, are connected directly or indirectly with game protection. Much of this work is of a character that requires independent action and judgment on the part of the individual, and it is readily apparent that only those of the force who take a deep personal interest in the wild life and are willing to work hard and at times undergo severe hardships for its sake, will be successful in accomplishing much good. It is very gratifying to be in personal touch with Chief Ranger McBride and several of his best men who have stayed with him in his struggles of the past three months to hold

our elk herds inside of the park and get them accustomed to a new feeding ground on Slough Creek where hay can be produced at a minimum of expense and the nucleus of a large herd can always be maintained during winters such as occurred a year ago when the danger of complete extermination is great. It is only in emergencies of this sort that the excellent qualities of the best men come out, and the weak ones of those less interested pale into insignificance. This innovation apparently is going to be a success as several thousand elk are taking this hay which is being fed at the rate of 4 to 5 tons a day. It has already become apparent that in the event of a late spring there is danger of the hay stacks giving out, and the strictest economy is being exercised in the distribution of this hay. If the success of this experiment warrants the continuance of the practice, additional facilities for housing men engaged in the work in winter on Hellroaring and Slough Creek, and for producing more hay on Slough Creek, will be needed.

Excellent cooperation in the matter of game protection around the park borders is had from several sources. This applies especially to the advice and assistance given by the Game Department of the State of Wyoming on the south and east borders of the park, and by the Supervisor of the Gallatin National Forest on the north and northwest, and the Supervisor of the Absaroka National Forest on the north. Since rumors were heard that residents of the old mining town of Electric, Montana, were killing on the Gallatin Game Preserve for meat, a Forest Ranger has been detailed to make a specialty of protecting this area; and several Forest Rangers have been and are still stationed in the Jardine-Hellroaring country to protect animals that are ranging outside of the park since the open season closed.

Both Park Rangers and Rangers of the Forest Service are deputized as State Game Wardens, without compensation, when such action can be of any advantage in protecting game animals.

The Montana State Legislature is now in session and several bills have been proposed tending to remedy the present loose conditions which prevail relative to protection of elk, which can be legally killed in Park County as late as Christmas.

YELLOWSTONE
NATIONAL PARK
LIBRARY
4421

Forest Fires.

Nothing to report. The forests are covered with a thick coating of snow and there is no possibility of a forest fire this time of the year.

Accidents and Casualties.

Ranger Russell fell from the roof of a Government building at Canyon, while shoveling off the snow, and suffered minor injuries which incapacitated him for heavy work for a few days.

Several employees were obliged to apply for short-sick leaves during the month, but none of them were seriously sick, except possibly Ranger Dewing, who is suffering from severe stomach trouble (ulcerated stomach) and was obliged to consult a specialist in Helena twice. He is improving somewhat recently, but the outcome of his attack is a little doubtful.

Medical Service.

Doctor W.E. Crawbuck, who furnishes medical service to park employees under special arrangement, returned from his eastern trip on January 10th.

Natural Phenomena.

The following notes on changes in the natural phenomena of the park are furnished by Park Naturalist H.P. Skinner:

At Mammoth Hot Springs: Blue Spring (the spring that furnishes water to Jupiter Terrace) has filled up with water and the discharge is greater now than for a year past. The spring to the south is steadily increasing in activity, the algae increasing wonderfully, and the coloring is rapidly becoming the best on the formation in point of variety and quantity both close to the spring and stretching down the slope to the road; better still, good views of this coloring can be had from close to the spring and from the road climbing the hill. Should this development continue, this terrace will be the most wonderful at Mammoth. The new spring rebuilding the Old Marble Terrace is maintaining its volume, although the coloring is improving. Angel Terrace is becoming more active, the algous growth is very good, and the coloring improving again in variety and quantity. The White Elephant remains the same. Activity at Orange Spring is increasing, especially on the big mound. Bath Lake and the Devil's Kitchen are the same as usual. The Narrow Gauge Terrace is building again at its

western end and the algous coloring is very fine, the tints being very delicate in shading. A small un-named terrace above the old Cupid's Cave is slowly spreading. Minerva Terrace has completely dried up with not even steam to be seen. Mound Terrace is normal. The Palette Spring is drying up. Cleopatra is normal in amount of water discharged and the coloring is probably the finest on the formation although the spring just south of the Blue Spring is a close competitor. Hymen Terrace is normal in activity, the coloring is still very good, although the algous growth is not so prominent.

The total activity of the formation is probably better than last summer, and as good as it ever was in historical times.

Special Visitors.

Messrs. Williamson & Bolles, former employees of the Yellowstone Park Camps Company, visited the park for the purpose of making arrangements with Messrs. Lacombe and Smith for rental of their ranch located on the park line where it is crossed by Slough Creek. They anticipate making a tourist ranch of it and making a practice of conducting tourist parties in that vicinity with saddle and pack outfits.

Mr. Frank J. Winess, formerly a member of our ranger force, visited some of his friends at Mammoth January 8th to 9th.

Motion Pictures.

No motion picture operators visited the park during the month.

Miscellaneous.

Entertainments: Moving picture shows were held in the Post Exchange Auditorium by park employees twice during the month.

Religious Services: Church services were held in the Chapel on the evening of January 31st, conducted by Rev. Clarence A. Kopp, Episcopal Minister, of Livingston, Montana.

Sale of Rifles: Two confiscated rifles, a 30 U.S. and a 303 Savage, taken from hunters in the park during the 1920 season, were sold at public auction January 10th, under your authority dated December 20, 1920. The two rifles

brought $18.50 before the block conducted by Ranger Bishop. They were sold to the following:

C.W. Whitman,	30 U.S.,	$7.50
C.A. Larsen,	303 Savage,	11.00

Sale of Cattle: The two calves and one yearling, property of the United States, which were raised at the Buffalo Farm, were sold to the highest bidder, and the money turned in with a special report, as authorized by your letters of December 30, 1920, and January 5, 1921.

X. RECEIPTS AND REMITTANCES:

A report of moneys due, collected, and transmitted, together with money orders and checks listed below, totaling $6.26, as shown by the report, are enclosed. Acknowledgment of receipt is requested.

Date	No.	Check	
1/20/21	699	Yellowstone Park Camps Co.,	$4.20

Postal Money Order

Date	Serial No.	Office	Remitter	
1/6/21	46044	Yellowstone Park	Geo. Whittaker	$2.06

Total remittance, ... $6.26

Cordially yours,

Chester A. Lindsley,
Acting Superintendent.

The Director,
National Park Service,
Department of the Interior,
Washington, D.C.

Enclosures.

CAL:CH

DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

YELLOWSTONE NATIONAL PARK

YELLOWSTONE PARK, WYO.

CE OF THE SUPERINTENDENT

February 1, 1921.

REPORT ON NATURAL PHENOMENA.

To: Chester A. Lindsley, Acting Superintendent.

From: M.P.Skinner, Park Naturalist.

At Mammoth Hot Springs: Blue Spring (the spring that furnishes water to Jupiter Terrace) has filled up with water and the discharge is greater now than for a year past. The spring to the south is steadily increasing in activity, the algae increasing wonderfully, and the coloring in rapidly becoming the best on the formation in point of variety and quantity both close to the spring and stretching down the slope to the road; better still, good views of this coloring can be had from close to the spring and from the road climbing the hill, should this development continue this terrace will be the most wonderful at Mammoth. The new spring rebuilding the Old Marble Terrace is maintaining its volume although the coloring is improving. Angel Terrace is becoming more active, the algous growth is very good, and the coloring improving again in variety and quantity. The White Elephant remains the same. Activity at Orange Spring is increasing especially on the big mound. Bath Lake and the Devil's Kitchen are the same as usual. The Narrow Guage Terrace is building again at its western end and the algous coloring is very fine, the tints being very delicate in shading. A small un-named terrace above the old Cupid's Cave is slowly spreading. Minerva Terrace has completely dried up with not even steam to be seen. Mound Terrace is normal. The Palette Spring is drying up. Cleopatra is normal in amount of water discharged and the coloring is probably the finest on the formation although the spring just south of the Blue Spring is a close competitor. Hymen Terrace is normal in activity, the coloring is still very good although the algous growth is not so prominent.

Total activity of the formation is probably better than last summer, and as good as it ever was in historical times.

DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

YELLOWSTONE NATIONAL PARK

YELLOWSTONE PARK, WYO.

CE OF THE SUPERINTENDENT

February 1, 1921.

REPORT ON SEASONAL CHANGES.

To: Chester A. Lindsley, Acting Superintendent.

From: M.P.Skinner, Park Naturalist.

Botanical: No growth and no changes.

Birds: Barrow golden-eyes appeared along the Gardiner River on the 8th and gradually increased until there are now about thirty of these ducks there. Magpies decreased steadily in numbers about the dump at Mammoth. A flock of redpolls appeared at Mammoth on the 1st and remained at least ten days. The following staid along the Gardiner River: 50 mallard, 6 American golden-eye, the thirty Barrow golden-eye noted above, a Wilson snipe, a kingfisher, 3 song sparrows, 75 dippers, and 8 Townsend solitaires. Near Mammoth were: 15 magpies, 4 nutcrackers, 2 black-headed jays, 3 pair of green-winged teal, and 3 pair of mallard; large mixed flocks of gray-crowned, Hepburn, and black leucostictes remained in the neighborhood.

Animals: While one old buck mule deer in poor health cast his horns on the 15th, the remainder of the mule deer have not yet begun to "cast their horns."

The white-tail deer began to shed their horns on the 20th.

The first of the month about thirty elk were feeding on the plaza at Mammoth but have since left, due, possibly, to a hard snow crust that formed on the 19th. There have been about seven hundred elk within four miles of Mammoth, and some are getting a little thin; their forage is decreasing perceptibly. About thirty elk are wintering on the top and the southern slope of Terrace Mountain, and a similar band on the southern slope of Bunsen Peak; every animal of both bands is in good condition.

The mountain sheep along the Gardiner Canyon come and go, twelve being seen on the 21st.

The storms of early January made the antelope very uneasy and they made some attempts to leave the Park, but frequent high winds and the thaw of the 17th and 18th uncovered some of their range and they became more content. They are now ranging rather high, but the elk are working down and pre-empting their range somewhat. 30% of the antelope bucks have new horns fully grown, and the remaining 70% have horns six inches or more in length.

The beaver are still cutting small cottonwoods along the Gardiner River.

January has probably the fewest seasonal changes of any month of the year. Consequently this data is not decisive in character. What there is of it, simply indicates a warm and open season.

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
YELLOWSTONE NATIONAL PARK
YELLOWSTONE PARK, WYO.

TICE OF THE SUPERINTENDENT

February 1, 1921.

REPORT ON INFORMATION SERVICE.

TO: Chester A. Lindsley, Acting Superintendent.

From: M.P.Skinner, Park Naturalist.

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88 Yellowstone National Park publications were sent out free. 69 short letters were sent out in reply to simple inquiries; 10 more letters requiring a longer, more technical replies were answered after spending the necessary time in searching out the information. In addition to the above, 125 letters applying for positions were answered, mostly by referring the applicants to the Hotel Company, the Camps Company, or the Transportation Company, depending upon the tone of the application.

C H I E F R A N G E R ' S R E P O R T

F O R T H E M O N T H O F

J A N U A R Y ?

1 9 2 1 .

James McBride.
Chief Ranger.
Yellowstone Park.

GENERAL CONDITIONS:

Following the close of the 1920 hunting season Rangers continued to direct their attentions to the protection of the game animals and were ordered to hold them in the park wherever posssible.

The great need of "line fences" has been very clearly shown in the following way:

1. Every man of the four arrested this winter, on charges of hunting in the Park, pleaded before the United States Commissioner, their ignorance in being within the jurisdiction of Yellowstone Park.

2. With abundant feed all over the ranges in the park, residents along its borders were often tempted to release their stock on these ranges. We have proof to the effect that this practice has been carried on by no small number of local stockmen.

3. Elk feeding along the park borders, where forage was found abundant, would drift across the line without the smallest intention of drifting to the lowlands. This is responsible for many deaths in the herd. With this fence, they no doubt would stay in the park until weather conditions became too severe. As the Rangers on the north line herded the bands during the past three months, this could be resumed when it became necessary and in this way the preservation of the game animals would be assured.

4. Deer are more inclined to drift in and out of the Park than are the elk. This, to a large extent is responsible for a greater number of deer being killed than elk.

5. Under existing circumstances, it is impossible to keep a check on the person or parties entering the Park. Local citizens along the park line enter and leave the park at will without informing the o officials of the nature of their business. This leaves them ignorant in most cases of depradations.

Unfavorable weather conditions have made the herding of the elk herds very difficult. A Chinook wind, light rain and then a quick change of temperature put a heavy crust of ice on the snow which made travel with horses a cruel act. This work had to be done at the cost of four horses. Though these horses were not killed, they will be of no use in snow again.

As the matter of this fence has been called to my attention by appropriation reports, I wish to urge its installation within the near future.

many respects.

TRAPPING:

Investigations conducted by Rangers in all districts of the Park in respect of trappers with lines along the borders of the park, revealed a decided decrease during the month in the number of trappers in each district.

Rapid advances in the price of furs has been reported but it is very doubtful that it will in any way effect the trapping to any extent this season. Most of the fur bearing animals have become very hard to trap.

Wyoming authorities have rendered such worthy assistance to the National Park Service, I am inclined to believe trapping along the borders of the park in this state has reached a climax and will soon be practiced in a very small degree.

Rumors at the first of the year to the effect that beaver trappers were making preparations to enter the Upper Yellowstone country, led us to measures which would flustrate these plans. They have failed to date to make their appearance, and I doubt very much if they will.

HUNTING:

In the past, it was a well known fact to this office that local people when in need of meat disregard game laws to satisfy their desire. As far as is known by me, no big game animals have thus far been killed out of season. Among other notable features the Rangers must be given credit for this added protection to the game herds.

Reports have reached me from Electric, Mont., to the effect that foreigners have killed several elk in the game preserve in the vicinity of the Park. After taking the matter up with the Forest Service officials protection was given from the ~~Gallatin~~ district. No depradations have been been observed since this preccaution was taken.

Rumors of a game preserve North and East of the Yellowstone River are very common, and seem to have a very reliable source. These rumors are wide-spread and have aroused the indignation of some few Montana persons. They are responsible for much adverse publicity.

We are expecting an investigation of this situation to be conducted this winter by a committee appointed during the session of the Montana legislature.

many respects.

GENERAL CONDITIONS.

FEEDING GAME:- - - - - - Elk:

With practically all of the elk in the Northern band working in the vicinity of Slough Creek, the feeding operations at the horse ranch has become very extensive. Hutchins has been ordered to feed as light as possible but the but its quality and quanity makes its extension to the opening of spring somewhat doubtful.

Though most of the hay fed has been consumed during the night, an estimate by myself and other Rangers places the number of elk eating their regularly at about 3,000. This number, under trying conditions, would draw many more elk to the fedd grounds.

Two teams and two men are engaged in this work. They are feeding between 8,000 and 10,000 pounds of hay each day. Five loads constitutes the day's haul, one of which, is fed to the government horses being cared for there.

A very heavy crust of ice on the snow, which formed during the first of the month, caused the elk to take more to the feeding grounds, The snow, quite deep in many places made grazing difficult and has began to tell on the general condition of the bands.

Buffalo:

The buffalo herd, though being in the very best of condition, is being fed about 4500 pounds a day to hold them in the "Upper country." The fact that I have instructed Lacombe to keep his animals away from Slough Creek to protect the elk, combined with the fact that forage on the range near the Buffalo Ranch is scarce, has made work in this department almost a hardship.

Many of the large old bulls have not returned to the ranch this fall. They have been seen quite often on Soda Butte Creek and in the hills near Pebble creek. Feed in this district is plentiful consequently, no effort will be made to take care of these bulls.

In spite of the deep snow, the herd rustles most of their feed. After talking the matter over with Lacombe, we believe it is possible to save about 3½ stacks of they hay in the meadows. I estimate the number of tons saved to date this year from the Buffalo Ranch crop at 125 tons.

many respects.

The usual proceedure in keeping the elk back in the Interior of the Park has been followed thruout the month at Hellroaring and Gardiner. In the face of a severe winter well under way, this work has been a remarable success.

It was only during the last of the month that bands of elk were reported out of the park. One small band left the Park at Crevice creek and then entered the park again, during the same day, at the mouth of Bear Creek.

A band of 125 on Coyote Mountain fought back the attempts of Rangers to hold them and crossed the line. They have since, been driven back in but cause considerable trouble. These have spent almost the entire fall and winter between Coyote and Cottonwood Basin.

Deep snow in the vicinity of the Crevice Station made travel an imposibility with horses. Consequently the station was vacated upon my order January 13th.

Elk working on Mount Everts have been held their successfully to date. None have crossed. Though the snow is deep in many places on the mountain and on the Black Tail they are able to find plenty of feed.

The men engaged in this work are:

Chief Ranger James McBride.
Ass't. Chief Ranger Harry Trischman.
Park Ranger Thad C. Pound.
" " Al McLaughlin.
" " James Dupuis.
" " F.J. Townsend.
" " Henry Anderson.
" " Clifford Anderson.

As the herding of the elk has proven to be the only way tp preserve the bands, I can see no reason why this work should not be followed on the same principle in the future. To make working conditions more favorable and a more assured success, I respectfully submit the following for your consideration:

1. That a new cabin be built in the Hellroaring district and that it be made a permanent winter station. Two or three men should be assigned to it for this work:

2. That facilities be improved at Slough Creek to cut a larger crop of hay for the elk and horse herds. Several new buildings should be erected as well as other miner improvements.

3. Several fences are quite necessary in some places. A fence, along the line anyplace, would have to be of steel or it will be useless and a detriment in many respects.

Three men on the Ranger Force were unable to render service during the month on account of sikness. Two were injured and one other granted leave for dental services.

These conditions, though unavoidable, has caused some few men to shoulder all of the burden of the protection at hand. With this, it must be taken into consideration, that all men willing have been ordered to the heaviest of the work and were held there. In most cases, the single man was given all of the hardships.

Again it is clearly shown that married men can not work in harmony with the standards and policy of this force. I am not able to order them to the many places where they would be of some service and would at the same time, give some deserving man a relief. Accomodations will not permit this in some instances and in others the danger is too great.

Court B. Dewing, has been unable to report for duty during the entire month. His condition is considered serious. I have granted him all of his annual and sick leave, which will extend to February 24, If at this time he is unable to report for duty, some action to replace him will have to be taken.

Fred J. Townsend has been confined at Chico Hot Springs for the past two weeks. I have been unable to learn the nature of his illness, but I understand, he has been ordered to take treatments daily.

Thad C. Pound was confined at his home three days on one occasion and two days on another with stomach troubles. He has complained of this ailment all fall.

Peter Lawson, injured December 23 at the Hell-roaring Cabin, was unable to report for duty until January 13th.

James Russell, fell from the roof of the Engineer building at the Canyon while shoveling snow from its roof and suffered minor injuries. He was unable to work for more than a week.

Leaves were granted to the following:

C.J. Smith,	7 days.	E.T. Scoyen,	1½ days
T.C. Pound,	1 day.	S.T. Woodring,	3 days.
F.J. Townsend,	6½ days.	George Winn,	11½ days.
B.C. Lacombe,	2 days.	Peter Lawson,	21 days.
C.B. Dewing,	24 days.*	C.B. Dewing,	25 days.
* Balance of leave.		Al McLaughlin,	6 days.

On Federal duties and [illegible]

GENERAL CONDITIONS:

WORKING CONDITIONS:- - - Con't.

Many complaints have been received at the office from men returning from a snow-shoe trip in respect of the rations furnished them at the cabins. They commonly complain about it not being a balanced ration and of the condition it is found in.

Rations in all snow-shoe cabins unoccupied, is, of course, frozen. Frozen vegitables are in most cases never used. Men desire canned soup in place of canned vegitables.

The men who have made these complaints are not men known as trouble makers. They merely expressed themselves in frank terms.

WEATHER AND SNOW:

Only one cold period was recorded during the month while precipitation was measurable 18 days of the month. The average snowfall over the entire park is reported at about 14 inches.

The depth of snow at the following points is:

Mammoth,	10.50	Madison Junction	39.00
Norris,	36.00	Riverside,	36.00
Canyon,	50.00	Yellowstone,	30.00
Lake,	41.00	Gallatin,	24.00
Thumb,	40.00	Grayling,	24.00
Upper Yellow.	41.00	Bechler,	40.00
Snake River,	52.00	Cascade,	60.00
Soda Butte,	30.00	Tower Fall	24.00
Buffalo R.	22.00	Crevice,	36.00
H'll'g.,	18.00	Gardiner,	Trace.

Drifts in many places along the roads of the park will make it difficult for road crews to open them. A slide in the Devil's Gut has left 20 feet of snow. It became necessary to place a rope in the Golden Gate to allow Rangers to pass back and forth without taking the extra four miles via Snow Pass.

Many high winds were reported during the month, the highest, reaching a velocity of 45 miles an hour.

No reports have been received from Sylvan Pass. The last to the effect that 18feet of snow had drifted into the Pass.

Yellowstone Lake froze over in very bad shape. It is considered dangerous to some extent to travel over it. On the other hand Lewis Lake froze even and solid. Ass't. Chief Ranger Douglas reported many air holes, cracks and large humps in the Yellowstone.

PREDATORY ANIMALS:- - - - - Trapping:

We are in receipt of several applications from men not employed in the National Park Service, to trap wolves, coyotes and mountain lion in the park. No action has been taken in regard to them.

Ranger Henry Anderson, was instructed during the last of the month, to begin trapping all predatory animals possible. Previous to that time he shot 33 coyotes. These have been turned over to the Chief Ranger's Office for disposal.

Wolves working in the Hellroaring and Slough Creek districts have caused considerabel damage to the game herds. Fresh carcases are reported quite often.

Rangers Hans Larsen and Peter Lawson have been ordered to make preparations to trap in the vicinity of Mammoth and the Black Tail.

Mr. Lee Webb and Bert Stinnett, National Park Service employees have proven themsalves worthy of hunting permits. They have killed seven coyotes and have taken extensive trips for wolves and mountain lion.

Other men in the department with permits have failed on each attempt. Though most of the men spend all or part of their Sunday's hunting coyotes, and do so under our restrictions, I have noticed the elk herds are restless for several days after each hunt.

Another objection is, when a Ranger hears the report of a gun, he generally makes a search for the peron carrying it. At a distance, it is quite hard to distinguish the hunters and they do not attempt to relieve these difficulties by reporting the time and district in which they expect to hunt.

Up to the present time I have raised no objection to these hunters keeping the hides of the coyotes they kill. These hides will be held in the future at the Chief Ranger's Office until properauthority is given to return them to the hunter.

Though the increase in the predatory animals is quite large, I believe that we will have them thinned out to a large degree before spring.

Forest Rangers have expressed a desire to hunt predatory animals in the Hellroaring and Slough Creek districts of the park. These men would not have the time to hunt very far into the interior of the park. No action has been taken upon the request.

GAME:

ANTELOPE:

Constant watch over these animals this fall and winter by members of the Ranger force, has, from all indications, saved the band from any loss. The carcass of one antelope was found during hunting season, which was brought down by a pack of coyotes. No other carcass has been found.

A notable feature of this band, has been that they are didvided into two herds, one working across the target range on Mount Everts and the other in the grain fields near the Gardiner Ranger Station. The latter band drifts along the park line to the foot of Electric Peak, but Rangers patroling this district throw them back to Gardiner.

The young are almost full grown and are in very good condition. Feed being plentiful and very little snow on the ground is a big asset to the herd.

DEER:

The deer, during the last of the month, had considerable trouble in reaching the forage, due to the deep snow, but, with the exception of a few, they are strong and healthy. Fawns have matured rapddly, and, are in better condition than the older animals.

Reports from Rangers in the Northern district to the effect that predatory animals were bringing down deer, have been confirmed. An estimate from the reports, would put the number killed at about twelve or fifteen.

Two buck deer, feeding in and around Mammoth have shed their horns. This is accounted for by the warm waves and to an injury of another.

White Tails are scarce in the northern district. There are nine at Mammoth and I have no reports to the effect that others have been observed in the Interior of the park.

ELK:

All elk herds continue to feed on the high ridges and leave there only during the night. They are seen regularly well in the interior of the park, where, for the past several years, elk have not been known to feed in the country.

Small bands are wintering near the Lake Station and a band of 65 above the Gallatin station. About 200 were seen between the Upper Basin and the Fountain.

ELK - Cont'.

The Northern herd will come out of the winter in very good condition. Feed, though buried under deep snow is plentiful.

Two large bands of bulls have been reported. A band of 12 is wintering at the head of the Oxø Bow and a band of almost twenty has been seen near Sepulcher Mountain. Two five point bulls are wintering at Mammoth.

Per the request of officials of Sheridan, Wyo., Ranger Peter Lawson has placed an elk trap near the Power House, where a "spike" will be captured. This work will take some time.

MOUNTAIN SHEEP:

Apparently, the mountain sheep are going to winter unmolested. No reports have reached me that predatory animals have dragged any of them down.

Several hundred sheep are winter between Tower Falls and the north line. They have remained in this vicinity all fall.

Though a few of these animals have been seen out of the park, I am inclined to believe, they came off Sheep Mountain, west of the Yellowstone River.

Moose:

Reports have been received showing that Moose over the entire park are shedding their horns. I consider this a good sign of an early spring.

Herdsin the Upper Yellowstone are wintering in in tip top shape. None have been found dead, which prevails all over the park. It seems that all of the old animals died during the winter of 1919 and 1920.

BUFFALO: - - Wild Herd.

I have ordered Rangers Winn and Scoyen and Ass't. Chief Rangers Trischman and Douglas, to ski into the feeding grounds of the wild herds. This trip will be made to ascertain the number in the park and will give me some idea as to the numberlost in 1919 and 20.

Rangers Bicknell and Russell counted twenty two on Pelican during the last of the month.

BUFFALO - Tame Herd.

Following the heavy loss to the calf crop of 1919-20, four buffalo calves have been born out of season so far this year. In addition to the two born in December, two more were born January 14. They are in very good condition.

This unusual condition is explained by Lacombe, and others familiar with breeding, in the following way:

It is a well known fact that many of the old buffalo cows slink their calves during the winter while being milled back and forth from the Buffalo ranch. With this, they were in such poor condition they could not furnish nourishment to carry the calf to maturity.

Cold weather, heavy snow and exhaustion brought the "slink." At the time the cow should have calved, she came in heat instead and was served by the many bulls. Being bred during the season in which they should have had their calved, would naturally bring the calves from two to four months early, or, the difference between calving and breeding season.

After discussing the situation with Lacombe, we agreed that we will never overcome the heavy loss to the calves as long as they animals are constantly stirred up. When herding them for motion picture men in the early spring, many calves are crushed to death and many others are crippled. Then again in long drives these cows, holding late calves, become injured or slink their calf and again we face a loss.

GENERAL TRAVEL:

Vistors to the park during the month were few. Three California tourists spent week ends at Mammoth and three other parties spent the day going over the formations and taking pictures of the game.

Sking in the park has made travel difficult. So far this year, Rangers say the sking has been very poor. The light snow without a good thaw gives them much snow to buck. The Rangers in Mammoth on official business during the month were:

George Winn,	Leave.
C.J. Smith,	Transfered.
James Russell,	Business.
F.J. Townsend,	Sick Leave.
Joe Douglas,	Business.
C.O. Davis,	Leave.
B.C. Lacombe,	Leave.
Hans Larsen,	Detailed.

Rangers:

Tentative plans for the coming tourist season, relative to the placing of the men and applicants to be considered, have been practically completed.

No changes in station detail has been made this year. Ranger Hans Larsen, occuping Crevice station, was removed January 13, the snow being too deep for effective work. No other stations were vacated.

CHIEF RANGER JAMES MCBRIDE:

Almost the entire month was spent in the elk districts, supervising the feeding and herding of the bands.

ASS'T. CHIEF RANGER HARRY TRISCHMAN:

Feeding the elk at Slough during the first of the month. Ordered to Hellroaring Cabin to relieve Ranger Townsend. Inspection of northern district.

ASS'T. CHIEF RANGER JOE DOUGLAS:

Patrols in eastern and southern district of the park. At Upper Yellowstone with Scoyen and Davis, investigating trapping situation. To Mammoth at request of Chief Ranger McBride.

Ranger W. M. Bishop:

Duty at Chief Ranger's Office during the entire month. Assisted with men putting up ice. Leave ½ day.

Ranger T. C. Pound:

Entire month herding back elk on Mount Everts. Given one day leave. Reported elk more contented and death of three deer.

Ranger Al McLaughlin:

Herding elk and antelope during the month. Was granted one week leave.

Ranger C. B. Dewing:

Physical condition kept him off duty during the entire month. Was granted Sick leave.

Ranger Hans Larsen:

At Crevice station during first of the month patroling park line. Transferred property and then detailed to work on ice pond.

Ranger Peter Lawson:

On sick leave during first of the month. Ordered to Gardiner to relieve McLaughlin. Prepared fence and feed to trap elk.

PERSONNEL:

RANGERS:

Ranger Clifford Anderson:

At Hellroaring herding elk and patroling the north line. Ordered to Slough Creek to feed elk with Hutchins.

Ranger George Winn:

Patrols along the north and east line during first of the month. Given two weeks leave. Worked in Hellroaring, and Slough Creek districts. Patrols in neighborhood of Soda Butte.

Ranger Henry Anderson:

At Hellroaring Cabin herding elk and patroling north line. At Soda Butte covering district. Ordered to trap predatory animals. Reported 33 coyotes killed during the month.

Ranger James Dupuis:

At Hellroaring cabin during the entire month herding elk and patroling district.

Ranger R.R. Wisdom:

Patrols in Sylvan Pass district. Reported few trappers in district.

Ranger E.T. Scoyen:

Patrols along east line. To Mammoth on leave. Returned to Uepper Yellowstone and patroled tarpping area.

Ranger C.O. Davis:

Patrols to Lake and in Upper Yellowstone district.

Ranger James Russell:

Patrols to Thumb station for reports. To Mammoth with reports. Ordered to shovel snow from government buildings at Canyon. Injured in work. No serious.

Ranger A. T. Bicknell:

Patrols to Pelican, Park Point and Thumb. Trip to Canyon to shovel off station. Reported 22 Buffalo in Pelican district.

Ranger William Purdue:

Trip to Moran and Ashton. Two trips to Cascade cabin.

Ranger Earl Bowman:

Trip to Mammoth during last of Month extended into January. Returned to Lake, thence to Upper Basin. I do not know the object of this trip.

Ranger F.J. Townsend:

Herding elk in Hellroaring district until 23rd. To Mammoth on leave.

Ranger Raymond Little:

Patrols in Southwest corner of park. Trip to Ashton. Trip to Cascade and along line North.

Ranger Lee Cottrell:

Daily patrols in neighborhood of station. Trip north along west line and east along south line.

ASS'T CHIEF RANGER C.J. SMITH:

Patrol to grayling cabin. Ordered to Mammoth. Left Yellowstone National Park for Grand Canyon National Park, January 6, 1921.

Ranger Ford Purdy:

Patrols to South Riverside Cabin, to Grayling cabin, to Madison Junction and to Yellowstone.

Ranger Luther Custer:

Patrols to South Riverside Cabin, to Grayling cabin, to Madison Junction and to Yellowstone.

Ranger S. T. Woodring:

Patrols to Eldridge, Montana, to Sportsmans Lake, to Grayling.

Ranger Roy T. Frazier:

Patrols to Grayling, to Gallatin Mountains looking for lost horses, to Sportsman Lake.

W O R K C O M P L E T E D :

RIFLE SALE:

Two confiscated rifles, a 30 US and a 303 Svage, taken from hunters in the park during the 1920 season, were sold at public auction January 10. The two rifles brought $18.50 before th block conducted by Ranger Bishop. They were sold to the following:

C. W. Whitman,	30 US	$7.50
C. A. Larsen,	303 Savage,	$11.00

Repectfully James McBride

James McBride,
Chief Ranger